

MIXED WASTE TEAM REPORT
SITE VISIT TO THE UNIVERSITY OF WISCONSIN-MADISON
MARCH 4, 1998

Purpose, Location and Participants

At the invitation of the University of Wisconsin-Madison's Safety Department, members of the EPA mixed waste team visited the campus on March 4, 1998, to gather information concerning the generation, storage and management of mixed wastes which are generated by a university through hospital and research laboratory activities.

Participants included:

EPA:

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Eric Glatstein, Region V,

UW-Madison:

Dr. David Drummond, Director, Safety Department
Ron Bresell, Radiation Safety Officer
Ralph North, Safety Department
Pete Reinhardt, Assistant Director, Chemical and Environmental Safety
Dennis Silbaugh, Safety Department

Background

The University of Wisconsin-Madison (UW-Madison) is the sixth-largest university in the nation with a student enrollment of 40,196 (fall 1997). UW-Madison was ranked third among the nation's universities in research-and-development spending in fiscal year 1994-95. UW-Madison ranked fourth in federal research grants received among public universities. About 9,500 research projects are being conducted at any one time.

Discussion

EPA participants arrived at UW-Madison's Health and Safety Department building (30 North Murray Street) at 1:00PM. EPA and UW-Madison Safety Department Staff met for approximately two hours to discuss the University's practices and issues related to the management of hazardous waste, radioactive waste, and mixed waste.

During the meeting, we discussed UW-Madison's current and future waste management program. The University's radiation safety and chemical safety programs are integrated into one program implemented by the Safety Department. Most of the radioactive waste and hazardous wastes are generated by campus research activities. UW-Madison's Safety Department is considered a service program for the University's research and other activities. There are two University committees which provide guidance, direction and oversight to campus researchers and interfaces with the Safety Department on regulatory matters. One is the Chemical Safety Committee and the other is the Radiation Safety Committee. Each committee is comprised of a faculty representative from each of the major schools on campus (e.g., Engineering, Pharmacy, Business). To help ensure that hazardous chemicals and radionuclides are managed properly the University requires the principal investigator (a faculty member), who is the authorized user, to ensure that his or her staff use the materials safely and properly.

One of the goals of the Safety Department's management program for mixed wastes is to minimize the generation of mixed waste while not inhibiting research. This is achieved by the continuing education of faculty, students and others who might generate mixed waste. A major example of the waste minimization effort is the conversion to the use of non-ignitable liquid scintillation fluids. As a further example, the University has instituted a practice whereby researchers must submit a "Protocol Summary Sheet" to the Safety Department before they can acquire radioisotopes for research experiments. This "Protocol Summary Sheet" includes a number of important elements such as a description of the radionuclide; the general experimental procedure that will be followed; and information related to any mixed, radioactive, or unusual wastes that will be generated. Implementation of the protocol summary sheets as well as other efforts has significantly reduced the generation of mixed waste. (For example, the volume of ignitable mixed waste (DOO1) generated has decreased from 919 liters in 1995 to 414 liters in 1997.)

The University generates two main categories of mixed waste: bulk ignitable fluid and ignitable scintillation vials. The largest volume of waste stream generated is bulk ignitable fluids. For mixed bulk ignitable fluids with a half life of less than 120 days, they allow the material to decay, then reanalyze, and dispose as hazardous waste. If the waste has a half life of greater than 120 days, the University sends it to DSSI for treatment and disposal. For bulk ignitable Carbon-14 and Tritium, the University has petitioned the NRC asking if they can classify these wastes as no longer radioactive due to the similarity to scintillation cocktails with the same chemical and

radiation make up that have such an NRC regulatory exemption¹. The University has been storing these wastes for over a year awaiting an NRC response even though treatment does exist. UW-Madison also generates a significant volume of scintillation vials. They currently pack this in drums for shipment to Permafix.

The University currently stores all of its RCRA waste, including mixed waste, and radioactive waste at two storage facilities located on the UW-Madison campus. Current facilities include the Mill Street storage building. This building is used to manage hazardous and radioactive waste including waste collection, sorting, analysis and storage. Another facility, the Herrick Drive storage building, is used for overflow storage of radioactive and hazardous waste. Each of these current storage units have a RCRA Part B permit.

In October of this year, the University will begin construction of a new Environmental Management Center (EMC) for the centralized storage of hazardous and radioactive waste at the Murry Street location. The EMC will cost approximately \$4.7 million. It will provide better ventilation and fire suppression. The University plans to use this facility for less than 90 day storage, and, therefore, does not plan to get a RCRA storage permit.

The UW-Madison campus is part of a State-wide waste management (including mixed waste) contract with Chem Waste Management that covers the whole University of Wisconsin System and all State Agencies. The University of Wisconsin also has a contract with Adco for low-level radioactive waste. Waste drums and containers are picked up periodically by the vendors as part of a "milk run" to all the state facilities that have generated hazardous and mixed wastes.

UW-Madison's Safety Department staff wanted to discuss several important waste management issues and challenges that face the University. The Safety Department staff discussed its concerns with the storage time limits that currently exist for RCRA wastes. The storage time limit results in a severe inefficiency for entities that generate small quantities of mixed waste and only have small quantities to ship for treatment and disposal. The University staff stated that from a cost perspective it needs to be able to accumulate larger volumes of mixed waste before shipment. The University staff also expressed concerns about the limited number of vendors who provide treatment or disposal for mixed waste. In fact, according to the

¹Scintillation fluids containing only tritium and/or carbon-14 in concentrations less than .05µci/gm may be disposed without regard to radioactivity.

University staff, for most mixed waste streams generated by the University only one vendor is available for treatment and disposal. The vendor has minimum volume requirements, and charges a minimum of \$5,000 per shipment.

We also had a discussion of the potential outcomes of the mixed waste rulemaking being undertaken by EPA. UW-Madison staff presented a number of ideas on what they think should be considered to provide mixed waste regulatory relief. We discussed storage-for-decay options, treatment on-site, and incentives for waste minimization. The staff told us that for storage-for-decay to provide meaningful relief to them it would have to be for long periods of time. They also stated that due to the ways wastes were generated and managed on a large university campus, we should consider allowing the movement of satellite accumulation points from the research labs to a central location managed by a university's waste and safety management organization.

Facility Tour

The tour, which lasted about two hours, started with a visit to the Mill St. storage building. At the building we observed a shipment of radioactive and mixed waste being delivered. The shipment included small to medium sized cardboard boxes of scintillation cocktails and lab equipment that had low-level radiation contamination. At the facility we obtained an overview of how the University processes (sorts, characterizes and tracks) its mixed and low-level radioactive waste. We also were shown the storage areas where the waste is being stored pending shipment for treatment and disposal. For the most part, the facility seemed to be adequately managing its mixed and low-level radioactive waste. However, due to the large variety waste and container types, the storage areas had the appearance of being cluttered.

Next, we visited a laboratory of Dr. Suttie in the Biochemistry Department. Dr. Suttie's laboratory uses radioisotopes to study the metabolism and properties of vitamin A using high performance liquid chromatography (HPLC). Due to the difficulty in disposing of mixed waste, the researchers have been making efforts to recycle and reuse the radioisotope since it is essential for their research.

Our next stop was Dr. Busee's allergy and immunology laboratory at UW-Madison Hospital. Dr. Busee's uses volatile liquid scintillation cocktails in his allergy research. The research involves looking at the reaction of lungs to various allergens using lung washes. To analyze the results, the researchers use a number of analytical techniques that do not

involve the use of radionuclides when possible. However, the use of scintillation cocktails containing radioisotopes allows much greater precision and provides a much lower detection limit. It was stated that the use of scintillation cocktails containing radioisotopes increased sensitivity by two orders of magnitude.

We then met with Dr. Ian Carlson who discussed UW-Madison's research and safety philosophy.

The last stop was the Herrick Drive storage building. The Herrick Drive facility is used as an overflow storage building. The building contained 55 gallon drums of radioactive, mixed, hazardous and other wastes. Building did not appear to be well ventilated, and did not have heating or cooling systems.

We concluded the meeting at about 5:30 PM with follow-up questions and closing discussion.